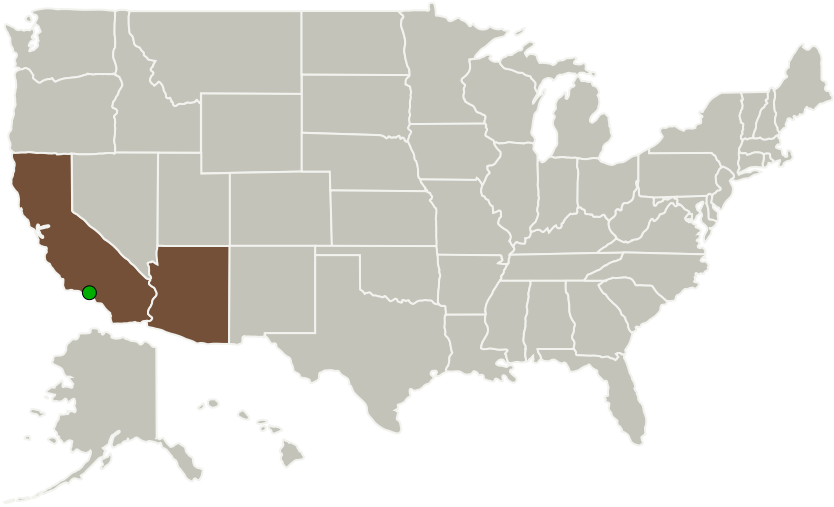
High Power Room Temperature Terahertz Local Oscillator, Phase II

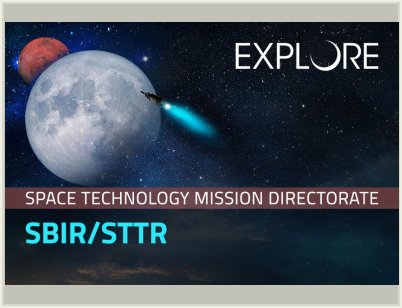
Completed Technology Project (2011 - 2013)

Project Introduction

The motivation of the proposed SBIR is to develop, demonstrate and commercialize a compact, low-mass, high output power (1-10 milliwatt), tunable source of CW THz radiation operating at room temperature. The source will be useful both as a narrow band frequency stable sources for driving heterodyne receivers at key frequencies between 1 and 5 THz (1.4, 1.9, 2.7, 4.7 etc..) or for laboratory sources to characterize THz components, including MMIC's, or possibly for active spectrometers in an in-situ environment The proposed source would enable the development of THz array receivers for use in space and suborbital missions, or for atmospheric sounders and planetary landers. In Phase 1 our VECSEL THz source, based on intra-cavity difference frequency generation, demonstrated 2mW at 1.9THz running on a finite number of cavity modes with a linewidth per mode of around 1MHz. Desert Beam Technologies will team up TeraVision (Tucson) and with researchers at the Steward Observatory Radio Astronomy Laboratory (SORAL), University of Arizona in Phase 2 to further characterize a breadboard VECSEL 1.9THz system, measure Y-factor and I-V curves, redesign the VECSEL cavity to reduce it to single mode operation and test it as a local oscillator for SORAL's 1.9THz receiver.

Primary U.S. Work Locations and Key Partners





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Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
Desert Beam Technologies, LLC	Lead Organization	Industry	Tucson, Arizona
Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations	
Arizona	California

Project Transitions

June 2011: Project Start

May 2013: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138929)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Desert Beam Technologies, LLC

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

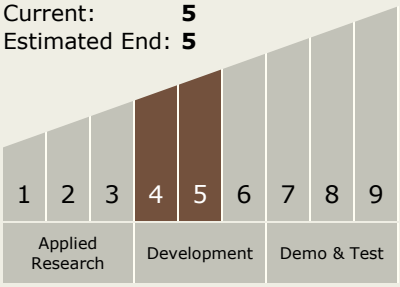
Carlos Torrez

Principal Investigator:

Justin Paul

Technology Maturity (TRL)

Start: **4**
Current: **5**
Estimated End: **5**



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Technology Areas

Primary:

- TX02 Flight Computing and Avionics
  - TX02.1 Avionics Component Technologies
    - TX02.1.6 Radiation Hardened ASIC Technologies

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System